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EX PARTE OR LATE FILED

September 23, 2014

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Marlene H. Dortsch, Secretary
Federal Communications Commission
445 12111 Street, S.W.
Room TW-A325
Washington, D.C. 20554

RE: Protecting and Promoting the Open Internet, GN Docket No. 14-28
Notice of Ex Parte Meeting

Dear Ms. Dortsch:

On September 11, 2014, I made a presentation summarizing the main points of an academic paper at the AEI/UNL/FCC Broadband Workshop held at The Federal Communications Commission. The following employees of the Commission attended all, or part of the Workshop:

Tim Brennan, Chief Economist, also Office of Strategic Planning (OSP); Jonathan Chambers, Chief, (OSP); Matthew Collins, Wireless Telecommunications Bureau (WTB); Nicolas Degani, Office of Commissioner Pai; Ena Dekanic, Legal Fellow, International Bureau (IB); Matthew DelNero, Deputy Bureau Chief, Wireline Competition Bureau (WCB); Judith Dempsey, (WTB); Martin Doczkat, Office of Engineering and Technology (OET); Kristine Fargotstein, (WCB); Pramesh Jobanputra, WTB; Scott Jordan, Chief Technologist (also OSP); Jonathan Levy, Deputy Chief Economist (also OSP); Catherine Matraves, WTB; Jon Sallet, General Counsel; Gigi Sohn, Office of the Chairman; Daniel Shiman, Media Bureau (MB); Walt Strack, Chief Economist, (IB); Antonio Sweet, (OSP); Sarah Weeks, (OET); and Irene Wu, International Bureau (IB); Susan Singer, Chief Economist, (WTB); Charles Mathias (WTB); Amanda Burkett (OSP); and Sherille Ismail (OSP).

The purpose of the workshop was to promote analysis on the future of broadband regulation through a series of academic presentations and discussions between scholars and policy makers. I attach a

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copy of my presentation slides and my paper entitled The FCC's Open Internet NPRM and the Close of Utility Regulation.

The presentation and paper constitute my unsponsored views on the nature of recently proposed internet regulation. I currently am a professor of law at Michigan State University College of Law, but note that the views expressed in the paper and slide presentation are mine alone.

Respectfully submitted,

Adam Candeub.

Adam Candeub

cc: Attachments

# The FCC's Open Internet NPRM and the Close of Utility Regulation

Adam Candeub
Michigan State Univ. College of Law

AEI/FCC/Nebraska Conference:
*Regulating the evolving broadband ecosystem*
September 11, 2014

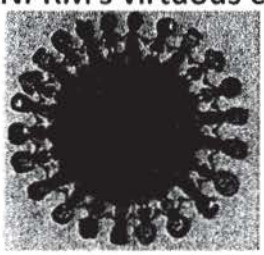
**Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014)**

- Regulatory goals are not clear
  - What's the "virtuous circle" of internet innovation?
- Description of internet markets unfocused
  - Distracts from potential market power abuses, i.e., broadband providers' access peering
- Disclosure regime likely unwieldy
  - Useful, simple metrics likely require grassroots, distributed data collection

## Departing from traditional utility competence

- Traditional utility regulation
  - Goal
    - allocative, productive efficiency
  - Method
    - ratemaking
      - FCC: long-distance access charges, cable regulation under the 1992 Act, TELRIC
- NPRM
  - Goal
    - virtuous circle
  - Methods
    - "commercial reasonability" standard
    - "minimum level of access"

## The NPRM's virtuous circle



The positive feedback of "innovation, demand for Internet services, and deployment of broadband infrastructure and that, absent such rules, broadband providers would have the incentive and ability to inhibit that deployment" (para. 32)

## What could that mean?

- Broadband and its applications complement
  - Insight with no particular regulatory response
- Broadband providers will foreclose competitors' content
  - Controversial claim
    - Broadband and content complement
    - FCC may not engage in market power analysis (para. 43)
- Regulators should regulate broadband to get lots of innovation
  - Maximizing innovation is a difficult regulatory goal

## Better Broadband Deployment + Cooler Applications = Internet Innovation

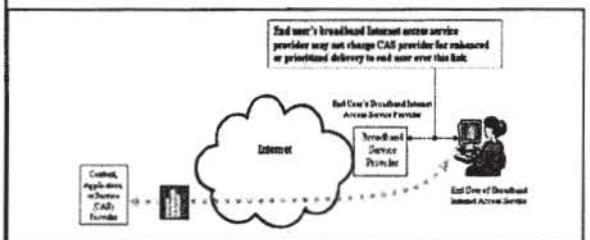
- How much investment for each and from whom?
  - Central question for internet innovation
  - Not clear FCC (or anyone else) has the answer

## FCC's tentative answer

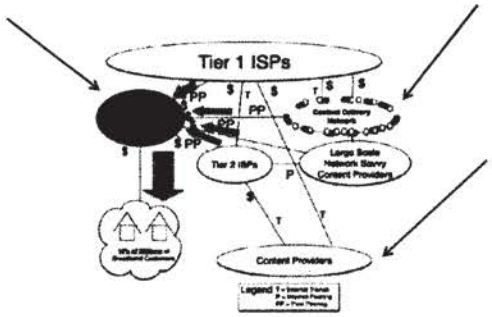
- Forbid "commercially unreasonable" contracts between content producers and broadband providers
  - "practices that, based on the totality of the circumstances, threaten to harm Internet openness and all that it protects" (NPRM, paras. 116)
  - "Rebuttable presumption" against foreclosure as in cable and satellite transmission (NPRM, paras. 122-128)
- Essential mechanism
  - Limit broadband providers' extraction from content producers

## FCC vague in how foreclosure might occur

- Comcast does not (usually) have direct relationships to content providers

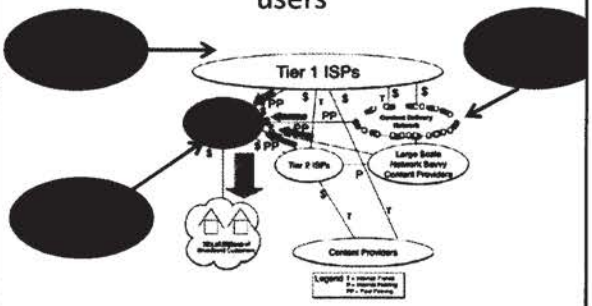


## The Video Internet



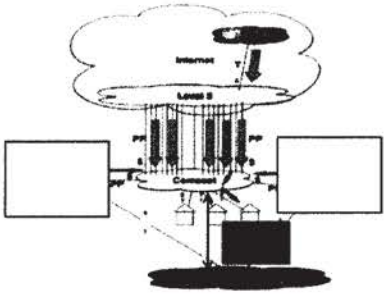

Credit: William Norton, 2014 Peering Playbook

## 3 ways for content producers to reach users




Credit: William Norton, 2014 Peering Playbook

## Market power: Access Peering




Credit: William Norton, 2014 Peering Playbook

## Commercial Reasonability?

- What is "reasonable" for Netflix to pay Comcast ?
  - If you want to truly maximize broadband applications, the answer might be 0
    - Comcast should run free T1, T3 lines to every startup in the Silicon Valley

"the Commission need not engage in a market power analysis to justify its rules" (NPRM, para. 43)

## Is internet regulation converging on media ownership rules?

- NPRM seems to suggest so in its references to section 628(b) of the Act, which proscribes certain "unfair methods of competition" by cable operators and certain programming
- Clear departure from traditional utility regulation
  - Increases regulatory and legal uncertainty

## Minimum Level of Access

- NPRM's second most salient regulatory proposal
  - If broadband providers offer only one level of access, foreclosure is difficult
- But, can FCC specify *right* level of access?
  - Normal subscription
  - CDN-located
  - Access peering

## Specifying "minimum access" frustrates the entire network neutrality debate

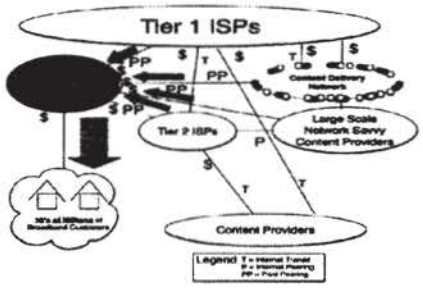



Figure 10-7. The Access Power Peering paradigm.

## Then What Must Be Done?

## Disclosure

$$V_u \approx \sum_{c \in C_u} \left( \sum_{d \in D_u(c)} \left[ Session_u(d, c, \{T_n(c) \mid n \in N(u,d)\}) \right] \right)$$

| | |
|---|---|
| $V_u$ | the value of access to a single user $u$ |
| $C_u$ | the set of all classes (or types) of $u$'s traffic |
| $D_u(c)$ | the set of all destinations (or sources) of $u$'s traffic of type $c$ |
| $Session_u(d, c, treatment)$ | the value to $u$ of $c$ traffic receiving *treatment* when transmitted between $u$ and $d$ |
| $T_n(c)$ | the treatment network $n$ gives to the traffic of class $c$ |
| $N(u,d)$ | the set of networks along the path between $u$ and $d$ |

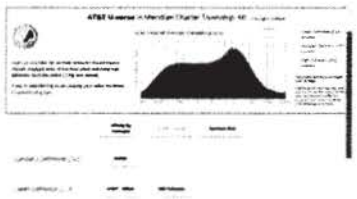
Candeub & McCartney, 2009

## What factors would meaningful internet QoS include?

- Download Speed, Jitter, latency, all relative to
  - Type of traffic
  - Distance travelled/ location of downloaded content
    - Number of hops
  - Transmission rates between all interconnecting networks (backbones, ISPs)

## Hard, not impossible, in a data-driven world

- FCC's broadband speed initiative
- Google's video quality report



## Use data to look for problems that have regulatory solutions

- What are the effects of market concentration of broadband provision?
- Does access peering diminish consumer surplus or content provision?
- Case-by-case adjudications may be best way to answer these complex problems

Adam Candeub, Michigan State University College of Law


ABSTRACT: The D.C. Circuit made clear that the FCC need not engage in a market power analysis as a prerequisite for regulating the internet. The FCC's May 15th *Protecting and Promoting the Open Internet Notice of Proposed Rulemaking* (NPRM), therefore, does not identify any market power abuse to remedy. Instead, it forwards a governing metaphor or goal: the virtuous circle of internet innovation. In order to protect fringe content producers and foster this virtuous circle of innovation, the NPRM considers requiring broadband providers to offer consumers a "minimum level of access," *i.e.,* quality of service (QoS), and prohibiting them from engaging in "commercially unreasonable practices."

These two proposed regulatory standards reflect a marked departure from traditional areas of regulatory competence. While the FCC and state regulatory commissions have a long history of regulating telephone QoS, internet service quality depends on myriad more factors that likely will render meaningful regulation of a "minimum level of access" impossible. Similarly, prohibiting "commercially unreasonable practices" goes beyond classical utility regulation principles, which focus on cost-based ratemaking to mimic functioning markets. (Spulber & Yoo, 2003; Frieden, 2004) More broadly, the NPRM's stated goal—protect the "virtuous circle" of internet innovation—departs from the traditionally understood regulatory goal of allocative efficiency (Yoo, 2013) and lacks an underlying theory to guide it.

Without these tools of classical utility regulation, the FCC's proposals seem without standard, reminiscent of those media and cable ownership regulations that attract continual judicial review and fail to provide predictability for industry. (Candeub, 2009) On the other hand, the NPRM, for the first time moves beyond the last mile to achieve a more complete view of internet markets. (Candeub & McCartney, 2010, 2012) The NPRM does provide the potential for a useful disclosure of market practices and a case-by-case adjudication regime that could examine possible competitive problems. These might include broadband providers' pricing of "access peering" with certain content providers. (Norton, 2014)

*Introduction*

The Federal Communications Commission's May 15th *Protecting and Promoting the Open Internet Notice of Proposed Rulemaking* (NPRM) responds to concerns that broadband providers will limit the ability of fringe firms to introduce, develop, and distribute new content, applications and programs. The NPRM puts forth a metaphor to describe internet economic development: its "virtuous circle of internet innovation" in which an "open internet" allows a level playing field for all innovators, new and incumbent, to distribute and market their content.[1] In contrast, the NPRM presumably aims to avoid a vicious circle—in which a dominant broadband provider blocks fringe content producers from accessing its end-users or raises the cost of doing so, chilling innovation by making marketing and distributing web content more difficult.

The FCC naturally seeks rules that will lead the internet economy to virtue, and its NPRM has two salient approaches to accomplish this end. First, building on the no-blocking rule that the FCC first put forth in the Madison River case,[2] the FCC suggests imposing a minimum level of access—or, in other words quality of service (QoS)—that broadband providers would have to offer customers.[3] Second, the NPRM states that due to "broadband providers' incentives to engage in practices that affect the Internet's openness," the FCC proposes mandating providers engage in "commercially reasonable" practices—particularly in their agreements with edge providers.[4]

The "minimum level of access" and "commercially reasonable practices" standards reflect a significant departure from traditional telecommunications regulation. While minimum levels of service quality (QoS) have long been part of telecommunications regulation,[5] they only emerged in fully regulated networks, i.e., the local and long-distance monopoly of the AT&T era. The regulator can impose his or her mandates on the *entire network.*

As has been pointed out, the complexity of internet interconnection will make minimum quality of access (QoS) mandate quite difficult: the quality of internet connection for any given

[1] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 23.
[2] In re Madison River Communc'ns, LLC and Affiliated Companies, Consent Decree, 20 F.C.C.R. 4296, ¶ 1 (Mar. 3, 2005)
[3] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 89-108.
[4] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 116-135.
[5] See, e.g., Rates for Dominant Carriers, Memorandum Opinion and Order, 6 FCC Rcd 2974 (Com. Car.Bur. 1991) (Service Quality Order), reconsideration 6 FCC Rcd 7462 (Com. Car. Bur. 1991) (setting forth quality parameters for incumbent local telephone companies).

session depends on a host of factors and unregulated parties, including the type of application, the user's own interface and local network, the number of networks that must exchange the downloaded material as its packets travel across the internet, and above all, the contractual terms under which the user's broadband provider and its interconnecting networks exchange traffic.[6] This, in turn, makes quality measurements quite complex. Even disclosure of these relationships is quite difficult to achieve.[7]

"Commercially reasonable practices" create even greater questions. The FCC will simply "prohibit as commercially unreasonable those broadband providers' practices that, based on the totality of the circumstances, threaten to harm Internet openness and all that it protects."[8] And, by practices, the NPRM means prices that content providers pay to reach the broadband providers' customers. The prices presumably must be set so as to preserve "virtuous circle of internet innovation."

Previous FCC telecommunications regulation, which draws on decades of utility regulation, answered a different pricing question: given there is a monopoly, what is the appropriate consumer price that best mimics a properly working market. As the landmark *Hope Natural Gas* case states,

> "[T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."[9]

Utility pricing theory provides a cost-based method for calculating consumer prices for goods that attempts to minimize market distortion and provide adequate incentive for investment. These pricing schemes achieve, in theory, a clearly accepted normative goal: allocative efficiency.[10] And, these schemes work without too much difficulty to this day in United States electricity and gas markets.[11]

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[6] Adam Candeub & Daniel John McCartney, Law and the Open Internet, 64 Fed. Comm. L.J. 493, 534 (2012).
[7] Adam Candeub & Daniel John McCartney, Network Transparency: Seeing the Neutral Network, 8 Nw. J. Tech. & Intell. Prop. 228, 228-30 (2010) .
[8] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 116.
[9] Fed. Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591 (1944).
[10] See generally William J. Baumol & J. Gregory Sidak, Stranded Costs, 18 Harv. J.L. & Pub. Pol'y 835, 845 (1995) ("In the process, over the lifetime of an investment, the correct competitive payment will be the amount that is just sufficient to yield the accumulation of capital that can replace the investment in question at the end of its economic life, and that, during the lifetime, will provide investors with the current competitive rate of return on investment of comparable risk.).
[11] Jonathan A. Lesser, Emma Nicholson, Abandon All Hope? FERC's Evolving Standards for Identifying Comparable Firms and Estimating the Rate of Return, 30 Energy L.J. 105, 107 (2009) ("For the last seven decades, [the principle set forth in] Hope. . . . has been the sine qua non for determining whether regulated rates of return set by federal regulators, such as the FERC, and state utility regulators are just and reasonable.").

"Commercial reasonability" asks an entirely different question. It seeks to regulate price and market structure that will maximize FCC's virtuous circle of innovation.[12] There is no clear economic theory that answers this question and can guide specific policy decisions. While there are some interesting and important models linking innovation to network market structure,[13] these models are suggestive and not definitive. Rather, the distribution of profits among various net actors seems a difficult bargaining problem, for which economists are not likely to find non-controversial solutions.

In posing such unanswerable questions, the FCC turns away from the traditional consumer pricing found in Title II to less successful regulation, such as its media ownership orders. Here, the FCC attempted to ensure "commercially reasonable" relationships between certain parties to protect certain types of production. This goal is quite analogous to the FCC's efforts to protect fringe content producers on the internet from the potential market power of broadband providers.

For instance, in the cable ownership proceedings, the FCC aimed to limit the market power of the cable systems (analogous to the broadband providers) with respect to the television networks that produce content—which are analogous to the fringe internet firms that produce applications. Section 613(f)(2) of the Cable Act[14] directs that, in setting these limits, "the Commission shall, among other public interest objectives:

> ensure that no cable operator or group of cable operators can unfairly impede, either because of the size of any individual operator or because of joint actions by a group of operators of sufficient size, the flow of video programming from the video programmer to the consumer."[15]

Thus, the workings of the virtuous circle, i.e., ensuring broadband providers are regulated so as to ensure internet innovation and productivity, is analogous to "unfairly imped[ing] the flow of video programming," which aims to regulate cable companies to ensure television network innovation and productivity.

However, as discussed more fully below, the FCC could never find—and has still not, after two decades of trying and two slap downs from courts of appeals[16]—the magic market structure that maximizes the flow of programming. The FCC may face similar problems in finding the magic market structure to maximize its internet virtuous circle.

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[12] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 14.
[13] See, e.g., Choi, Jay Pil and Kim, Byung-Cheol, Net Neutrality and Investment Incentives (March 2010). RAND Journal of Economics, Vol. 41, No. 3, 2010.
[14] 47 U.S.C. 533.
[15] 47 U.S.C. 533(f)(2).
[16] See Comcast Corp. v. F.C.C., 579 F.3d 1 (2009); Time Warner Entm't Co. v. FCC (Time Warner II), 240 F.3d 1126 (2001).

The article proceeds as follows. First, it seeks to identify a possible market failure—namely what one industry observer has called "access power peering."[17] This occurs when broadband providers with market power demand money from content providers to peer. Second, the paper examines the FCC's most salient proposed legal standards for protecting internet content providers: its minimal access standards and its commercial reasonability. The minimal access standard is an outgrowth of the FCC's no-blocking rule and springs from the same legal authority—section 706. The article argues that the standard is intractable given the complex, heterogeneous nature of internet interconnection. Similarly, the "commercial reasonability" analysis—even if it includes a price component—presents difficult regulatory challenges, in addition to the overriding challenge discussed above: finding an access price or market structure that will maximize the virtuous circle.

The article concludes that the NPRM's most promising way forward is its suggestion to use case-by-case adjudication, along with carefully tailored disclosure requirements, to begin an inquiry into whether and how broadband providers exercise market power against content providers.

I. What's the problem that the NPRM identifies as requiring regulatory intervention?

While the D.C. Circuit made clear that the FCC need not find market power in order to impose open internet rules,[18] it is hard to see what purpose internet regulation should have other than to fix a market failure or counteract market power. In previous telecommunications regulation, the FCC had a clear goal: set prices because, due to market power, intervention was necessary to mimic the workings of a competitive market.

In the Open Internet NPRM, however, the FCC is aiming to defend internet open-ness and its virtuous circle: increase innovation of fringe applications, demand for Internet services, and deployment of broadband infrastructure. Absent the FCC's intervention, broadband providers would inhibit this circle—or so the FCC claims.[19]

When examined, the FCC's definition of "open"-ness is vapid. It assumes that there are no tradeoffs between investing in the development of applications and investing in infrastructure. Almost magically, increased innovation in applications will necessarily drive demand, which will lead to more infrastructure investment.

But, there is a cost to openness. An internet capitalist must decide where to invest the marginal dollar: infrastructure or applications innovation. Similarly, the FCC's governing metaphor, the virtuous circle, must optimize over the cost of infrastructure and application innovation—i.e., find the most efficient balance of investment in these two essential parts of internet usage. By regulating the infrastructure to protect fringe innovation and, in effect, make it cheaper, the FCC limits the broadband provider's ability to recover its costs from applications. By so disadvantaging providers, the FCC is in effect deciding that innovative applications are

[17] William B. Norton, The 2014 Internet Peering Playbook at 137.
[18] Verizon v. FCC, 740 F.3d 623, 648 (D.C. Cir. 2014).
[19] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 24.

somehow more important and more valuable even though the internet economy needs *both* innovative apps and fast broadband. The best division of investment between these two links in the internet economy is a decision usually left to the marketplace. But, the FCC states no theory of how it could figure distribute this investment.

The risk of FCC's tipping the scale towards openness (but ignoring the cost of openness) is clear when we ask how broadband providers might act in ways to chill innovation. First, they could block or degrade sites that potentially compete with them. The NPRM concedes that actual blocking on the web is rare in the United States.[20] What the FCC seems more concerned about is some sort of exchange in which content providers pay for priority delivery: "commercial agreements with edge providers to govern the carriage of the edge providers' traffic."[21] The FCC is remarkably vague about *how* broadband providers might extract these extra payments.

The FCC NPRM suffers from failing to describe how the internet market works, particularly in how content providers reach end users. Content providers always pay for access to broadband end-users/consumers. If one moves beyond the last mile, the internet is held together by a series of peering and transit agreements, the details of which little is publically known. As FCC researcher Mark Kende described decades ago, peering agreements allow two networks to exchange traffic for free, exchanging each other's address books of entities connected to its network. Each party is essentially paying in-kind for the benefit of a faster connection to each other's connectivity to the web.[22] A peering partner will deliver internet traffic to anyone on his network, but he will not deliver traffic addressed to users not on his network.

On the other hand, transit relationships involve payment, i.e., a smaller network pays a larger. Generally the larger network guarantees the smaller network that its will deliver all of its traffic to the entire internet. Top-level backbones, like Level 3, generally can provide access to the entire web.[23] Thus, if you were a network and wanted to deliver your content all over the web, you could enter into a transit agreement with a backbone.

To complicate matters, content delivery systems (CDNs), such as Akamai or Limelight, improve specific content download to particular broadband providers' customers. They do so by locating content "near" broadband providers, and they often pay large broadband provider networks to peer.[24]

A content provider who wants to reach a particular broadband provider's end-user has three main options:

(i) Sign up for standard internet service, say Verizon. The content will travel from Verizon to a to backbone and--through whatever peering and transit

[20] Id. at para. 23. ("As noted above, the Commission has pursued policies to safeguard Internet openness for over a decade. Thus, while the number of existing cases has been relatively few, we believe this to be primarily due to the fact that the Commission has had policies in place during the period in question that it has been ready to enforce."). Given that the Commission has had no binding rules on network neutrality for the last decade, its claim to have kept the net "open" seems suspect.
[21] Id. At para. 37.
[22] Mark Kende, The Digital Handshake: Connecting Internet Backbones. Federal Communications Commission (FCC), OPP Working Paper No. 32, Sep. 2000.
[23] William B. Norton, The 2014 Internet Peering Playbook 45-50.
[24] Id. at 34.

agreements with ISPs and backbone access providers that Verizon has—the traffic will reach the end-user. The content provider would simply pay for an internet subscription.

(ii) Or, the content provider can contract with a CDN, who will place the content on the web, presumably close to the broadband provider's network; that would cost a bit more.

(iii) Finally, the content-provider could try to peer with the broadband provider—which will likely cost the most.

Thus, all content providers always bear some cost of reaching their end-user. Broadband providers could furnish access to all innovators for free—building out their network to every start-up in Silicon Valley, Northern Virginia, and Austin, Texas and offering service at no charge. Surely that would maximize innovation as innovators would have virtually no cost in distributing their innovations; the virtuous circle would be maximally virtuous, probably producing more innovation than people could consume. As a result, broadband providers could not raise prices to pay for these upgrades, and they would go bankrupt—or at least there would be inefficient investment.

Obviously, then, given that there is a price for innovation—even in the virtuous circle, the proper regulatory concern is what this price should be. The recent controversy between Netflix and Comcast is illustrative. As many recognize, since 2011, nearly half of all internet traffic is video, and this percentage is growing. Internet users download huge amounts of video—in advertisements and in streaming services like those from Netflix. Internet users typically do not upload, i.e., distribute their own videos into the web, on a similar scale, if at all. This results in traffic imbalance for broadband providers, such as Comcast. They deliver huge amount of video traffic to their subscribers, but their subscribers do not send equivalent traffic in other direction.

Like most providers, Comcast had a policy to peer with large networks. According to William Norton, Comcast had a peering relationship with a major backbone, Level 3. At the same time, Netflix had been using Akamai as a CDN to ensure its content was received in a timely way by Comcast customers. In late 2010, Level 3 won the bid to become Netflix's CDN. This resulted in Level 3 asking for more interconnect capacity from Comcast to download all of the Netflix traffic. Comcast refused and demanded *paid* peering from Level 3, which it got.[25] However, eventually, Netflix became its own CDN and entered into paid peering directly with Comcast pursuant to a publicized agreement earlier this year.[26]

[25] Id. at 145.
[26] Shalini Ramachandran, Netflix to Pay Comcast for Smoother Streaming Deal Ends Standoff, Might Serve as Precedent for Relations With Other Broadband Suppliers, Wall. St. J. (Fed. 23, 2014), athttp://online.wsj.com/news/articles/SB10001424052702304834704579401071892041790.

In these transactions, Comcast engaged in what William Norton calls "access power peering."[27] This occurs when a broadband provider has market power—due to its network's number of consumers whom video content providers want desperately to reach. Broadband providers can demand paid peering from the content provider. Because content providers have to pay something to get their products to consumers, payment is appropriate. *Pace* the *Verizon* court and the FCC's NPRM, the appropriate open internet question is whether or not these payments reflect some type of abuse of market power.

A. Is access "power peering" a bad thing?

Conceivably, access power peering could present anticompetitive problems. The broadband providers could use their control of access to the eyeballs that all the video content producers wants so desperately to reach to become the monopolist toll keeper, a modern day Terminal Railroad Association, siphoning off profits from all content providers—creating either market failure (lower production of content and higher prices) or some diminishment of the incentives to innovate. On the other hand, economists differ as to whether this would happen. Internet usage and content are complementary. There is an argument that an ISP would want to increase demand for content, regardless of its source.[28] The payment that Comcast apparently demanded from Netflix simply reflects a wealth transfer—and would not inflict any consumer harm. These economic arguments, relying on models of vertical foreclosure or two-sided markets, often have become quite technical and difficult, and do not suggest firm generalized policy conclusions.[29]

But, notice how the NPRM makes this analysis harder. Most of the economic literature turns on whether this arrangement will lead to *efficient* results with some conclusions about investment tradeoffs between infrastructure and applications.[30] Modern antitrust analysis centers on ensuring that market power does not lead to actual inefficiency. The NPRM, however, does not seek efficiency as a goal. Rather, it seeks something more ambitious: the virtuous circle. The NPRM aims to forbid commercial arrangements that will diminish innovation and create some sort of perfectly maximizing level of investment between applications and infrastructure—which is something quite different from efficiency. This project would require two regulatory feats: First, one would have to set a price. While the NPRM does not say it will be involved in ratemaking, the "reasonability" of any system turns on how much broadband providers charge for access peering for video traffic. Second, the FCC will at the very least have to give a sense of what price is reasonable. The tools the FCC has at its disposal may simply not be up to the task.

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[27] Norton, supra note 23, at 137.
[28] Johannes M. Bauer & Jonathan A. Obar, Reconciling Political and Economic Goals in the Net, 30 The Information Society: An International Journal 119 (2014).
[29] Id.
[30] Id.

B. If access power peering is a potential problem, what can the FCC do?

The NPRM's proposed types of regulation: no-blocking prohibitions and minimum quality assurances each presents difficult legal and regulatory problems if used to counter abusive access peering prices. Least difficult, and least helpful to the supposed problem, would be no blocking. This approach would not remedy access peering.

Second, there is minimum level of access. In theory, such an approach could solve the problem. ISPs would have to deliver all traffic in the same way. And, indeed, that is how the old telephone system was regulated—QoS standards were rigidly enforced throughout the entire network. But, it is not clear that agencies can easily impose QoS on the internet given its structure. As described more fully below, the internet consists of numerous networks connected by a plethora of different contracts with different quality assurances. And, that's a good thing. Not every internet customer needs the same amount of bandwidth. Furthermore, the nature of quality assurance is so difficult to measure given that traffic travels in unpredictable ways. It would seem as if traffic from distant locations would inevitably be slower (have more hops) than local; after all, the logic of CDNs ameliorates the problem: move content closer to users and increase download speeds. But, the randomness renders QoS measurements and guarantees difficult to impose. Further, distinctions for types of traffic (streaming video vs. email) are essential parts of network management. Preventing ISPs from treating certain traffic differently could make more difficult the necessary discrimination that makes the network work.

Third, there are reasonable commercial practices. Of course, the central issue as to whether any commercial transaction is "reasonable" is, of course, price. And, though the NPRM does not say so explicitly, any determination as to whether access peering constitutes unreasonable commercial practice will turn on its price. How much is Netflix paying Comcast? Going back to Title II, prices developed under "just and reasonable" standard of section 201 have a long history and evolved method. The FCC –like all utility regulators—is very experienced in determining cost-based pricing. But, because the FCC relies on Title I jurisdiction, the FCC cannot explicitly adopt such rules, and as discussed below, it is not clear that reasonable commercial practices constitute a standard that can easily guide regulators.

III. "Minimum level of access"

In the *Madison River* proceeding, the FCC stated in an enforcement proceeding that ISPs should not block access to whole classes of traffic—in that instance voice-over-IP. Building on this "no blocking" rule, the FCC proposes a "minimum level of access" rule. But, it is not clear *what* this rule proposes.[31] The FCC asks whether it should "define the minimum level of access from the perspective of end users, edge providers, or both."

[31] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 24.

Similarly, the FCC had questions about whether the minimum level of access rule should be

- "monitor[ed]" . . . and enforce[d] . . . . and measured . . . . using . . . . technical parameters, based on a sample, focusing on speed, packet loss, latency, or other factors . . . [and] exempting incidents of blocking that last for less than a specified amount of time;

- tailored to prevent "specific problems that a minimum level of service would avoid (such as preventing latency and jitter for services that tolerate them poorly)";

- " define[d as] a minimum level of access is as a requirement that broadband providers apply no less than a "best effort" standard to deliver traffic to end users;[32]

- Flexible to allow broadband providers would be free to negotiate "better than typical" delivery with edge providers . . . [but not] "worse than typical" service in the form of degradation or outright blocking; or

- [Thought of] as the level that satisfies the reasonable expectations of a typical end user.

This list seems to be a dirigiste reverie. As discussed above, quality of service throughout the internet differs tremendously based upon particular transit and peering agreements—as well as geography. (CDNs quite openly state that they provide better content by moving stuff closer to the ISP.) Thus, in any give internet session for any one broadband provider, "speed, packet loss, latency, or other factors" and most other "technical features" in which consumers might be interested will be radically different depending on what sites are being visited.

Furthermore, besides being diverse, these factors are difficult to measure. The FCC has an entire office attempting to measure broadband speeds pursuant to the Measuring Broadband America Initiative.[33] Other private parties are doing the same thing. For instance, Google's video quality report allows internet users to test video quality on their particular computer. Aggregating such data is important data for the owner of YouTube.[34] Similarly, firms like geeksquad have online tools to measure bandwidth speed.

While these quantities are not *impossible* to measure, they may be beyond the FCC's regulatory capacity or experience. As FCC regulations demonstrate, the old telephone network's

[32] For any particular type of Internet traffic, best-effort delivery would represent the "typical" level of service for that type of traffic—in effect, routing traffic according to the "traditional" architecture of the Internet.Open Internet NPRM, 24 FCC Rcd at 13086, para. 56 ("The Internet has traditionally relied on an end-to-end, open architecture, in which network operators use their 'best effort' to deliver packets to their intended destinations without quality-of-service guarantees.").
[33] http://www.fcc.gov/measuring-broadband-america.
[34] https://www.google.com/get/videoqualityreport/.

QoS could be meaningfully evaluated by five parameters: surveys of customer satisfaction levels, dial tone delay, transmission quality, on time service orders, and percentage of call blocking due to equipment failure.[35] Given the nature of the telephone network, these features could typically be measured centrally, with some type of "field" work to make sure the lines met the technical requirements for transmission quality (sound level and clarity). Furthermore, a telephone network (often legal monopolies) could measure quality across its entire network.

The measurement of internet QoS is highly complex in comparison. Likely, it will require some sort of distributed, mass data collection effort, involving the cooperation of crowd-sourced, individual users, like Google's video quality report. Given that just one factor in internet QoS, speed, already involves significant FCC effort, a complete internet QoS will likely be difficult to produce.

Yet even if this data were marshaled, a true internet QoS may be so complex so as to render it useless for the average user. The FCC would have to quantify standards for speed, jitter, and latency for the multitude of net applications, from video to email. For each standard developed for each type of applications, the FCC would have to collect data relative to network geography, i.e., must a broadband provider provide these speeds for *all content* or may it treat content that is closer geographically, which typically has faster connections, differently. If the FCC fails to provide data relative to network geography and simply reports a broadband provider's speed of interconnection with its peering backbone, then any rule can simply be circumvented by a CDN that locates content nearer to the ISP. Further, disclosure could require information about parties with which a broadband provider peered or pay peered—and /or their peering partners. No doubt the potential complexity of disclose prompted the NPRM asks for "on what level" these rules apply. If these rules apply at a meaningful level, i.e., the consumer's actual experience, their complexity could overwhelm.

## IV. Commercial Reasonability

Following the *Verizon* decision, the FCC cannot engage in common carriage-type regulation that requires providers to "to hold themselves out to serve all comers indiscriminately on the same or standardized terms."[36] On the other hand, the FCC asserts it has the power to impose rules that "permit broadband providers to serve customers and carry traffic on an individually negotiated basis" that is "commercially reasonable."[37]

It is far from clear what this standard means. The FCC relies on the *Cellco* decision[38] for the claim that while it lacks authority to impose "just and reasonable" terms under section 201, it

[35] Rates for Dominant Carriers, Memorandum Opinion and Order, 6 FCC Rcd 2974 (Com. Car.Bur. 1991) (Service Quality Order), reconsideration 6 FCC Rcd 7462 (Com. Car. Bur. 1991).
[36] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at para. 93.
[37] Id.
[38] Cellco Partnership (d/b/a Verizon Wireless) v. FCC, 700 F.3d 534 (D.C. Cir. 2012)

has authority under Title I to impose "commercially reasonable" charges.[39] While regulators know what "just and reasonable" cost based utility regulation looks like under Title II, no one knows what "commercially reasonable" means as the first petitions under the *Cellco* standard indicate.[40]

The *Cellco* case involved data roaming—the charges for data access that wireless operators impose upon out-of-network mobile devices. The court ruled that the FCC could not impose Title II cost-based rates. But, the court allowed the FCC under Title I to require broadband providers to serve customers and carry traffic on an individually negotiated basis, "without having to hold themselves out to serve all comers indiscriminately on the same or standardized terms," conditioned on whether the conduct is commercially reasonable.[41] The D.C. Circuit explained that such an approach distinguished the data roaming rules issued under Title I in *Cellco* from common carrier obligations and, therefore, this approach would be also permissible for regulating internet traffic under Title I.[42]

If the phrase means anything, however, "commercial reasonability" of a contract must mean that price bears some reasonable relationship to cost. In the *Cellco* order, the FCC is remarkably vague and lists a whole list of factors it will consider to determine whether a charge is commercially reasonable. But, cost does sneak into the list. The order states that "these factors relate to public interest benefits and costs of a data roaming arrangement offered in a particular case, including the impact on investment, competition, and consumer welfare . . . ."[43] But, the FCC, making clear that it is *not* making cost-based rates, states

> we clarify that, to guide us in determining the reasonableness of the negotiations, providers' conduct, and the terms and conditions of the proffered data roaming arrangements, including the prices, we may consider the following factors, as well as others; whether the host provider has responded to the request for negotiation, whether it has engaged in a persistent pattern of stonewalling behavior, and the length of time since the initial request . . .[44]

But, even if price is but one factor, how can the FCC determine whether price counts towards or against reasonability. There are two conceivable approaches. First, the FCC could use comparisons—similar access peering contracts. The problem with using comparison pricing is that peering is not a rate charged to consumers. The charges are unique to peering networks, depending on their relative size and where and how they peer. They are generally individually

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[39] Id.
[40] Verizon v. FCC, 740 F.3d 623, 648 (D.C. Cir. 2014).
[41] Id. at 652 (quoting Cellco, 700 F.3d at 548) (internal quotations removed).
[42] Id.
[43] Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile-data services, 26 F.C.C.R. 5411, 5412 (2011) ("Data Roaming Order").
[44] Id.

negotiated. Comparisons will be contentious. Unlike roaming, which is a simple per minute consumer charge, peering presents a variety of different parameters: location, build-out, speed, and, above all, symmetry of traffic and size of network.

Second, one could try cost-based approaches. This is even more difficult. How does one calculate the price that is reasonable for Comcast to terminate Netflix's traffic? The FCC, in fact, has a long history of setting access charges—as do all traditional utility regulators. Setting such a price under traditional ratemaking, as discussed above, involves calculating the cost for constructing the network and running the network. Then, one figures out demand and distributes costs over the projected users. This involves two steps: there is a direct cost to using the network and then joint and common costs must be distributed over all users. There is always an arbitrary element in distributing joint and common costs, although in practice most rates involved some sort of averaging.[45]

In an instructive example, the 1996 Telecommunications Act attempted to apply this approach to competitive networks, and serious problems emerged in the reciprocal compensations and termination charge proceedings. And, the reason is quite interesting. Previous access charge regimes involved calculating costs over a fully regulated network, such as the regulated incumbent local networks under the access charge regime. All fixed and sunk costs had to be recovered from the network in which the users belonged. This allowed rates to average the recovery of fixed and sunk costs over each user of the network—based upon expected usage if per minute charges were employed.[46]

The reciprocal compensation under the 1996 Telecommunications Act attempted to recover fixed and joint costs for terminating traffic originating from *outside* the regulated network.[47] The FCC set a rate to recover cost based upon an expected demand and balanced traffic between the regulated and unregulated network. Dial-up ISPs (or really the competitive telephone companies that served them) realized that they would be terminating hours of long, uni-directional traffic. Rates, however, averaged in joint and fixed costs based upon shorter calls and lower demand—and thus the per minute cost was too high in a world of unexpectedly long (and unidirectional) ISP dial-up traffic. The competitive telephone companies serving the dial ISP had imbalanced traffic in their favor, charged more than expected minutes—and thus raked in the bucks. Similarly problems exist for termination charges in other contexts.[48]

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[45] Adam Candeub, Network Interconnection and Takings, 54 Syracuse L. Rev. 369, 416 (2004) (the TELRIC rates required "a per minute recovery of costs that do not vary with minutes. This gave the state commissions the impossible task of assigning joint and common costs to each unit of production, i.e., each minute of phone call. It is a staple of microeconomics that it is an arbitrary exercise to apply joint and common costs to each output").

[46] Id. at 426

[47] Id. at 430

[48] Id.

Third, rates for transit or access peering may not be cost-based at all. Setting up peering connections is not likely to be that costly—rather, the relative benefits to the parties may drive peering decisions. Again, remember that as a rule only large networks peer. The benefit they receive from quick access to peering partner's networks justifies the cost. The only parties who access power peer have great need for immediate access to the network's end-users' eyeballs. The price, one suspects, that Comcast charges Netflix is not cost-based, but rather depends on Netflix's demand. It is not clear how regulators could mimic such prices. And, finally, unlike with cellphone data roaming which involves one consumer price, there may be efficient pricing discrimination going on in the access peering and transit markets—and any attempt to impose one price may disrupt those contracts to the detriment of the entire network.

## V. Network Disclosure and Returning to the True Problem

This paper's first section describes the possible market failure that the NPRM fails to explicitly describe: access peering whereby a dominant broadband provider charges content providers for immediate access to the network. Without expressing any opinion as to whether broadband providers are acting in anticompetitive ways in their transit and peering agreements, the paper claims that such activity could be a conceivable locus for such behavior, particularly if the content provider and the broadband provider compete in certain types of content provision. At the same time, however, the point has been made that little is known about internet peering and transit practices. And, such tactics would be beyond the purview of the FCC's first attempted network neutrality regulation, which concentrated solely on the last mile connection between end-user and broadband provider.[49]

The NPRM, in its willingness to look beyond the last mile, can deal with these concerns. Among its first proposals is disclosure, but caution is again advised. First, the disclosure is likely to be extraordinarily complex as complex as any minimum quality standard as discussed above. This is because internet QoS depends on so many different factors, and must be particularized for type of traffic and its travel path, that disclosure of QoS must be similarly complex.

Second, while the author once called for disclosure of all peering and transit agreements—reacting to the FCC's apparent ignoring of anything beyond the last mile in the 2010 Open Internet Order, the author is a bit more hesitant these days. Certainly, if efficient price discrimination is occurring in transit negotiations, the FCC may not be wise to mandate complete disclosure.

Further, it is not clear that the FCC can provide meaningful consumer disclosure given the complexity of web traffic. Perhaps, consumers could be best served by providing a bottom-up approach, with decentralized, real time data collection, based upon the model of Google's

[49] Adam Candeub & Daniel John McCartney, Law and the Open Internet, 64 Fed. Comm. L.J. 493, 534 (2012).

video time. The FCC's efforts to spearhead such an undertaking would be very welcome. And, to the extent the FCC becomes involved in the mandatory disclosure business, it should probably do so only in areas in which there is strong reason to believe that there are anticompetitive abuses.

## Conclusion

Despite some concerns about the FCC's NPRM, it does point a way forward to dealing with potential anticompetitive problems on the internet. First, expanding its view of the Internet away from the last mile both as far as disclosure and possible regulatory action will allow the FCC to regulate anticompetitive behavior that occurs deeper within the network beyond the last miles. Given the recent Netflix controversy, it may be that anticompetitive behavior lurks deeper in the web.

Second, the NPRM is right to examine the possibility of case-by-case adjudication and development of standards.[50] It is worth noting that the Madison River case emerged from a case-by-case enforcement action, which found blocking to be abusive. And, since then, there have been few reported cases, at least in America, of blocking. The experience suggests that the FCC can create and develop standards without rules. Given the complexity of internet markets, a gradual approach seems warranted.

Third, while the NPRM does not directly address the possible problem of anticompetitive peering pricing, it does set into motion mechanisms that could respond to them—which would first require a careful, perhaps confidential, disclosure regime and perhaps case-by-case determinations of possible market abuse.

[50] Notice of Proposed Rulemaking, Protecting and Promoting the Open Internet, GN Docket No. 14-28 (May 15, 2014) at paras. 61 & 111.